REMARKS

Claims 1-316 are pending in this application. No claims have been amended or canceled in this response.

I. Response to Rejection Under 35 USC §101 of Claims 1-316

In the Office Action, the Examiner rejected claims 1-316 on the grounds that "the disclosed invention is inoperative and therefore lacks credibly utility." Office Action, page 2, paragraph 1. Applicant respectfully traverses this rejection for at least the following reasons.

A. 35 U.S.C. § 101 Provides for Broad Coverage of Emerging and Unforeseen Technologies

The statutory limitations on the subject matter for which patent protection is allowed is set forth in 35 U.S.C. § 101, which provides that:

> [w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefore, subject to the conditions and requirements of this title.

The Supreme Court held that § 101 should be broadly construed to cover emerging and unforeseen technologies that fall within the scope of statutory subject matter, *i.e.*, subject matter of a "new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." According to the Supreme Court,

> . . . § 101 . . . is a dynamic provision designed to encompass new and unforeseen inventions. "A rule that unanticipated inventions are without protection would conflict with the core concept of the patent law that anticipation undermines patentability." . . . Denying patent protection under § 101 simply because such coverage was thought technologically

> infeasible in 1930, however, would be inconsistent with the forward-looking perspective of the utility patent statute. As we noted in [*Diamond v. Chakrabarty*, 447 U.S. 303, 100 S. Ct. 2204, 206 U.S.P.Q. 193 (1980)], Congress employed broad general language in drafting § 101 precisely because new types of inventions are often unforeseeable."

J.E.M. AG Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc., 534 U.S. 124, 135, 122 S. Ct. 593, 600, 60 U.S.P.Q.2d 1865, 1870 (2001) (citations and quotations omitted).

Further, "the language of § 101 is extremely broad." *Id.*, 534 U.S. at 130, 122 S. Ct. at 598, 60 U.S.P.Q.2d at 1868. Indeed, the Court ruled that the legislative history of the provision shows that Congress intended a broad application, and coverage of "anything under the sun that is made by man."

> In choosing such expansive terms as "manufacture" and "composition of matter," modified by the comprehensive "any," Congress plainly contemplated that the patent laws would be given wide scope.
>
> The relevant legislative history also supports a broad construction. The Patent Act of 1793, authored by Thomas Jefferson, defined statutory subject matter as "any new and useful art, machine, manufacture, or composition of matter, or any new or useful improvement [thereof]." Act of Feb. 21, 1793, § 1, 1 Stat. 319. The Act embodied Jefferson's philosophy that "ingenuity should receive a liberal encouragement." Subsequent patent statutes in 1836, 1870, and 1874 employed this same broad language. In 1952, when the patent laws were recodified, Congress replaced the word "art" with "process," but otherwise left Jefferson's language intact. The Committee Reports accompanying the 1952 Act inform us that Congress intended statutory subject matter to "include anything under the sun that is made by man."

Diamond v. Chakrabarty, 447 U.S. 303, 308–09, 100 S. Ct. 2204, 2207-08, 206 U.S.P.Q. 193 (1980) (citations omitted – ruling that human-made, genetically

engineered bacterium exhibiting properties not possessed by any naturally occurring bacteria was patentable subject matter under § 101).

The Supreme Court's statements in *J.E.M.* reiterate its earlier statements in *Chakrabarty*, where the Court instructed that

> [t]he subject-matter provisions of the patent law have been cast in broad terms to fulfill the constitutional and statutory goal of promoting "the Progress of Science and the useful Arts" with all that means for the social and economic benefits envisioned by Jefferson. Broad general language is not necessarily ambiguous when congressional objectives require broad terms.

Diamond, 447 U.S. at 315-16, 100 S. Ct. at 2211, 206 U.S.P.Q. at 193.

It is against this backdrop of broad coverage for emerging and unforeseen technologies provided by § 101 that Applicant's claimed invention must be examined.

B. The Examiner's Rejection

The Office Action alleges, "[s]ince applicant's invention is based on a form of hydrogen, which according to conventionally accepted scientific principle cannot exist, the invention would be inoperative and thus lack utility." Office Action, page 3, paragraph 1. However, the Office Action has failed to make a *prima facie* rejection of claims 1-316 on the grounds of lack of utility.

The Examiner has not evaluated all of the relevant evidence of record as required by the MPEP. For example, Applicant cited numerous references providing experimental evidence that corroborates the existence of "lower-energy hydrogen" in the Information Disclosure Statement (IDS) filed February 13, 2006. Thus, Applicant respectfully requests that the Examiner either evaluate all of the relevant evidence of

record, including the references cited in the IDS filed February 13, 2006, or withdraw the rejection of claims 1-316 under § 101.

C. The Examiner Bears the Burden of Establishing a *Prima Facie* Case of Lack of Utility

M.P.E.P. § 2107 sets forth the "Guidelines for Examination of Applications for Compliance with the Utility Requirement." *See also* Utility Examination Guidelines, 66 Fed. Reg. 1092 (Jan. 5, 2001). The Guidelines are "to be followed by Office personnel in the evaluation of any patent application for compliance with the utility requirements of 35 U.S.C. 101 and 112." M.P.E.P. § 2107. The Examiner must review the claims and written description to determine whether there is "any specific and substantial utility that is credible." *Id.*

The Examiner must initially presume that the applicant claimed an operable invention, and therefore, the applicant generally does not have to submit evidence of the invention's operability. Consequently, to reject a claim for lack of utility due to inoperability, the Examiner bears the burden of first showing *prima facie* that the claims are to an inoperable invention. *See, e.g., In re Brana*, 51 F.3d 1560, 1566 n.17, 34 U.S.P.Q.2d 1436, 1441 n.17 (Fed. Cir. 1995) ("[T]he PTO has the initial burden of challenging a presumptively correct assertion of utility in the disclosure."); *Fregeau v. Mossinghoff*, 776 F.2d 1034, 1038, 227 U.S.P.Q. 848 (Fed. Cir. 1985) ("The PTO, of course, bore the initial burden of showing *prima facie* that the claims sought to be patented were unpatentable.").

1. Applicant's Asserted Utility is Specific, Substantial, and Credible

Applicant's claimed plasma reactor generates power. The utility associated with the generation of power certainly cannot be questioned for its credibility or for not being well established. Instead, it is apparent that the Examiner is questioning Applicant's explanation of how the claimed invention works, and not the utility of Applicant's claimed invention. In fact, in the most recent Office Action, the Examiner makes clear that this rejection is primarily based on the fact that the claimed plasma reactor recites lower energy hydrogen, which the Examiner asserts "cannot exist." Office Action at 2-3. Thus, the Examiner's rejection is based on the grounds of disagreement with Applicant's explanation of how the claimed invention works, and not on the basis that the claims lack a credible asserted utility or a well-established utility. Applicant has established that Applicant's claimed invention possesses a clear, credible, and well established utility, e.g., a plasma reactor for generating power.

As the Examiner knows, Applicant's asserted utility "creates a presumption of utility that will be sufficient to satisfy the utility requirement." M.P.E.P. § 2107.02(III)(A). To overcome this presumption, the Examiner "must establish that it is more likely than not that one of ordinary skill in the art would doubt (i.e., 'question') the truth of the statement of utility." *Id.* The evidentiary standard to be used by the Examiner is a "preponderance of the totality of the evidence under consideration." *Id.* (citations omitted). To satisfy this standard, the Examiner must provide evidence that one skilled in the art would consider the asserted utility "false," i.e., not credible. *See id.*

"Credibility is assessed from the perspective of one of ordinary skill in the art in view of the disclosure and any other evidence of record (e.g., test data, affidavits or declarations from experts in the art, patents or printed publications) that is probative of the applicant's assertions." M.P.E.P. § 2107(II). Indeed, where the Office argues, as here, that the asserted utility is not credible, a *prima facie* showing of no specific and substantial credible utility must contain the following elements:

> (1) An explanation that clearly sets forth the reasoning used in concluding that the asserted specific and substantial utility is not credible;
>
> (2) Support for factual findings relied upon in reaching this conclusion; and
>
> (3) An evaluation of all relevant evidence of record, including utilities taught in the closest prior art.

M.P.E.P. § 2107(II); *see also* M.P.E.P. § 2107.02(IV).

While the Examiner argued that the claimed invention lacks a credible utility, with which Applicant continues to disagree, Applicant respectfully submits that the presently claimed invention is operative and, therefore, embodies a credible utility. Moreover, the fact that the Examine disagrees with the underlying reasons how the invention works is of no relevance to the asserted utility.

a) Applicant's Claimed Invention is Operable, and, Thus, Credible

The M.P.E.P. explains that a claimed invention is "inoperative," and, therefore, in violation of § 101, only if it is "totally incapable of achieving a useful result." M.P.E.P. § 2107.01(II) (citations omitted).

Unlike previous applications involving, for example, inventions directed to perpetual motion machines (*see Newman v. Quigg*, 877 F.2d 1575, 11 U.S.P.Q.2d 1340

(Fed. Cir. 1989)) or cold fusion (*see In re Swartz*, 232 F.3d 862, 56 U.S.P.Q. 2d 1703 (Fed. Cir. 2000)), here, the claimed invention, as-amended, works as claimed and achieves a useful result. *See, e.g.,* Figs 1-7, and the description at pages 18-36. Accordingly, the claimed invention is operative, and, thus, credible.

b) Applicant Does Not Have to Understand or Explain Scientific Principles of Claimed Invention

Even if the Examiner disagrees with Applicant's proposed theory underlying the claimed invention, Applicant need not know, appreciate, or disclose in the specification the scientific principles on which its invention operates. *See, e.g.*, *Diamond Rubber Co. of New York v. Consolidated Rubber Tire Co.*, 220 U.S. 428, 435-36, 31 S. Ct. 444, 447 (1911) ("A patentee may be baldly empirical, seeing nothing beyond his experiments and result; yet if he has added a new and valuable article to the world's utilities, he is entitled to the rank and protection of an inventor.... It is certainly not necessary that [an inventor] understand or be able to state the scientific principles underlying his invention, and it is immaterial whether he can stand a successful examination as to the speculative ideas involved."); *In re Cortright*, 165 F.3d 1353, 1359, 49 U.S.P.Q.2d 1464, 1469 (Fed. Cir. 1999) ("[S]tatements that a physiological phenomenon was observed are not inherently suspect simply because the underlying basis for the observation cannot be predicted or explained. Therefore, the board erred in suggesting that Cortright was required to prove the cause of the resultant hair growth.") (citations omitted). Thus, even if Applicant is incorrect as to why the invention operates as it does, which Applicant does not concede, this cannot be the basis for a utility rejection

based on inoperability. The fact remains that the claimed invention is operable, whether or not the Examiner agrees with the proposed underlying theory.

D. Even if the Burden Shifts to Applicant, the Evidence of Record Demonstrates a Specific, Substantial, and Credible Utility

Only when a *prima facie* showing of lack of utility has been properly established does the burden shift to the applicant to rebut it. *See* M.P.E.P. § 2107(II); *see also* M.P.E.P. § 2107.02(VI); *In re Brana*, 51 F.3d at 1566 n.17, 34 U.S.P.Q.2d at 1441 n.17 ("Only after the PTO provides evidence showing that one of ordinary skill in the art would reasonably doubt the asserted utility does the burden shift to the applicant to provide rebuttal evidence sufficient to convince such a person of the invention's asserted utility."). For the reasons discussed above, the Examiner cannot establish a *prima facie* case of lack of utility. However, even assuming, *arguendo*, that the Examiner established a *prima facie* case of lack of utility, and the burden to rebut it shifts to Applicant, Applicant respectfully submits that the evidence of record demonstrates a specific and substantial utility.

As explained in the M.P.E.P., if the burden shifts to the applicant, then the applicant should provide evidence that "[e]xplicitly identif[ies] a specific and substantial utility for the claimed invention" and that evidence of a "specific and substantial utility" was well established at the time of filing. M.P.E.P. § 2107(II). The applicant "has the burden to establish a probative relation between the submitted evidence and the originally disclosed properties of the claimed invention." *Id.* The Examiner "should review any subsequently submitted evidence of utility . . . ." *Id.* (emphasis added). Indeed, "[i]t is essential for Office personnel to recognize, fully consider and respond to

each substantive element of any response to a rejection based on lack of utility. Only where the totality of the record continues to show that the asserted utility is not specific, substantial, and credible should a rejection based on lack of utility be maintained." *Id.* Here, Applicant respectfully submits that the evidence of record demonstrates a specific and substantial utility, which clearly rebuts any possible *prima facie* case of lack of utility.

1. Standard for Showing Utility

The M.P.E.P. cautions that "the applicant does not have to provide evidence sufficient to establish that an asserted utility is true 'beyond a reasonable doubt'," nor "must an applicant provide evidence such that it establishes an asserted utility as a matter of statistical certainty." M.P.E.P. § 2107.03(VII) (citations omitted). Instead, the criteria for determining whether sufficient and satisfactory evidence has been provided is "if, considered as a whole, it leads a person of ordinary skill in the art to conclude that the asserted utility is more likely than not true." *Id.* (emphasis in original).

Applicant's specification is replete with descriptions of the claimed invention, which demonstrate a specific and substantial utility for the claimed invention, as-amended. Even if the Examiner makes a *prima facie* case of lack of utility, which Applicant asserts he has not for the foregoing reasons, it is well-known that a claimed invention is directed to a practical application of a 35 U.S.C. § 101 when it either:

(A) "transforms" an article or physical object to a different state or thing; or

(B) otherwise produces a useful, concrete and tangible result.

See M.P.E.P. § 2106.IV(C)(2). In the present case, the claimed plasma reactor clearly transforms a physical object that is initially in the form of a source of hydrogen, to

power. In addition, the generation of power clearly produces concrete and tangible results.

According to M.P.E.P. § 2106, an Examiner first shall review the claims and determine if they provides a transformation or reduction of an article to a different state or thing. If the Examiner finds such a transformation or reduction, he shall end the inquiry and find that the claim meets the statutory requirement of 35 U.S.C. § 101. If the Examiner determines the claims do not provide a transformation or reduction of an article to a different state or thing, he must determine whether the claimed invention produces a useful, concrete, and tangible result. As shown, the claimed invention meets the statutory requirements of 35 U.S.C. § 101, because it meets both requirements outlined in M.P.E.P. § 2106. As a satisfying either one of these exceptions would rebut the Examiner's rejection under 35 USC § 101, certainly meeting both do.

As stated, Applicant does not have to provide evidence sufficient to establish that an asserted utility is true "beyond a reasonable doubt." *In re Irons,* 340 F.2d 974, 978, 144 USPQ 351, 354 (CCPA 1965). Instead, evidence will be sufficient if, considered as a whole, it leads a person of ordinary skill in the art to conclude that the asserted utility is more likely than not true. See M.P.E.P. § 2164.07. The many examples in the specification showing the generation of power support Applicant's position of its asserted utility beyond a reasonable doubt, and certainly beyond the lower threshold of "more likely than not."

A litany of cases direct the Office to presume that a statement of utility made by an applicant is true. See *In re Langer*, 503 F.2d at 1391, 183 USPQ at 297; *In re*

Malachowski, 530 F.2d 1402, 1404, 189 USPQ 432, 435 (CCPA 1976); *In re Brana*, 51 F.3d 1560, 34 USPQ2d 1436 (Fed. Cir. 1995). Further, the M.P.E.P. warns that when a statement of utility is evaluated, Office personnel **should not** begin by questioning the truth of the statement of utility. Instead, any inquiry must start by asking if there is any reason to question the truth of the statement of utility. This can be done by simply evaluating the logic of the statements made, taking into consideration any evidence cited by the Applicant. If the asserted utility is credible (*i.e.,* more likely than not to be believable based on the record or the nature of the invention), a rejection based on "lack of utility" is **not appropriate**. According to the M.P.E.P., "Office personnel should not begin an evaluation of utility by assuming that an asserted utility is likely to be false, based on the technical field of the invention or for other general reasons." *See* M.P.E.P. § 2164.07.

In the present case, one can objectively conclude in view of the overwhelming evidence provided above, that the Examiner is not basing his assertions of lack of utility on the presumption that Applicant's assertions are true.

For all of the aforementioned reasons, Applicant respectfully submits that the § 101 rejection is in error and should be withdrawn.

II. Response to Rejection Under 35 USC §112, 1st Paragraph of Claims 1-316

The Office Action rejected claims 1-316 under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the enablement requirement. Applicant respectfully traverses this rejection because the Office Action has failed to make a *prima facie* rejection of claims 1-316 on the grounds of lack of enablement.

According to *In re Wands*[1], in determining whether there is sufficient evidence to support a determination that a disclosure does not satisfy the enablement requirement, the following factors should be considered:

(A) The breadth of the claims;

(B) The nature of the invention;

(C) The state of the prior art;

(D) The level of one of ordinary skill;

(E) The level of predictability in the art;

(F) The amount of direction provided by the inventor;

(G) The existence of working examples; and

(H) The quantity of experimentation needed to make or use the invention based on the content of the disclosure.

The Office Action purports to find a lack of enablement of the present claims based on the factors expressly identified in *In re Wands*. Office Action, paragraph bridging pages 3 and 4. However, the Office Action has not established a *prima facie* case of lack of enablement because the Office Action has failed to properly evaluate enablement according to the standards set forth in *In re Wands* and the MPEP.

As to **the breadth of the claims**, MPEP § 2164.08 instructs how to evaluate this factor from *In re Wands*:

> The focus of the examination inquiry is whether everything within the scope of the claim is enabled. Accordingly, the first analytical step requires that the examiner determine exactly what subject matter is encompassed by the claims. See, e.g., *AK Steel Corp. v. Sollac*, 344 F.3d 1234, 1244, 68 USPQ2d 1280, 1287 (Fed. Cir. 2003). . . . The second

[1] 858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988).

> inquiry is to determine if one skilled in the art is enabled to make and use the entire scope of the claimed invention without undue experimentation.

"[T]he scope of enablement must only bear a 'reasonable correlation' to the scope of the claims. See, e.g., *In re Fisher*, 427 F.2d 833, 839, 166 USPQ 18, 24 (CCPA 1970)." MPEP § 2164.08 (emphasis added). Moreover, "if a rejection is made based on the view that the enablement is not commensurate in scope with the claim, the examiner should identify the subject matter that is considered to be enabled." *Id.* (emphasis added).

The Office Action argues, "[t]he present claims encompass reactors . . . or process . . . more broadly than shown by the general guidelines in the specification, and without any specific examples." Office Action, page 6, paragraph under header number 8. However, this statement in the Office Action is merely the conclusion that the Office Action seeks to prove. The Office Action does not engage in any of the evaluation required by *In re Wands* in order to reach this conclusion. Moreover, the Office Action fails to identify the subject matter that is considered to be enabled, as required by the MPEP.

In addition, the Office Action argues, "[t]he Specification also does not show how applicant's process can be controlled to product [*sic*] the different levels of "p" (where n = 1/p) which are encompassed by the present claims." *Id.* However, the MPEP instructs that "the scope of enablement must only bear a 'reasonable correlation' to the scope of the claims" (emphasis added). There are presently not any claims directed to "controlling" the process to produce each of the different possible levels of 'p'. Thus, even if *arguendo* the Specification did not enable this particular manner of controlling

the process, which Applicant does not concede, this fact would not be dispositive of whether the enablement is commensurate in scope with the claims. Instead, Applicant respectfully requests that the Examiner evaluate the breadth of the claims consistently with MPEP § 2164.08.

As to **the nature of the invention**, **the state of the prior art**, and **the level of one of ordinary skill**, MPEP § 2164.05(a) teaches (emphasis added):

> The initial inquiry is into the nature of the invention, i.e., the subject matter to which the claimed invention pertains. The nature of the invention becomes the backdrop to determine the state of the art and the level of skill possessed by one skilled in the art. . . .
>
> The state of the prior art is what one skilled in the art would have known, at the time the application was filed, about the subject matter to which the claimed invention pertains. The relative skill of those in the art refers to the skill of those in the art in relation to the subject matter to which the claimed invention pertains at the time the application was filed.

The Office Action argues, "[t]he nature of the invention is that it is based on forms of hydrogen which cannot exist under the accepted laws of physics and mathematics." Office Action, page 5, paragraph under header number 4. The Office Action continues, "[t]here appears to be no prior art, other than by applicant, showing hydrogen with a binding energy corresponding to 'n' being a fraction, below the integer 1, or even any prior art which suggest that this hydrogen could exist in theory." Office Action, page 5, paragraph under header number 5. The Office Action repeats, "[t]he most highly skilled people in the art, physicists and chemists familiar with quantum mechanics, would regard the present hydrogen species as something that cannot exist . . ." Office Action, page 6, paragraph 1.

However, as explained above, the Examiner has not evaluated all of the relevant evidence of record in determining the state of the prior art. For example, Applicant cited numerous references providing experimental evidence that corroborates the existence of "lower-energy hydrogen" in the IDS filed February 13, 2006. Moreover, the Examiner has improperly disregarded all prior art other than prior art that is not by Applicant. There is no basis, in either the MPEP or patent law, to distinguish between prior art by Applicant and prior art by others in determining the state of the prior art and the relative skill of those in the art for purposes of evaluating enablement.

Furthermore, the Office Action appears to erroneously interpret *In re Wands* as requiring that the claimed invention itself must be taught in the prior art and within the skill of those in the art. According to this erroneous test, subject matter could never be both novel and enabled. As indicated in MPEP § 2164.05(a), *In re Wands* does not inquire whether the claimed invention itself is taught in the prior art and within the skill of those in the art. Rather, these factors inquire as to the state of the prior art and the level of ordinary skill in relation to the subject matter to which the claimed invention pertains. Thus, Applicant respectfully requests that the Examiner evaluate the nature of the invention, the state of the prior art, and the level of one of ordinary skill consistently with MPEP § 2164.05(a), considering all of the relevant evidence of record.

As to **the existence of working examples**, it is well-known that "the mere fact that something has not previously been done clearly is not, in itself, a sufficient basis for rejecting all applications purporting to disclose how to do it." *Gould v. Quigg*, 822 F.2d 1074, 1078, 3 USPQ 2d 1302, 1304 (Fed. Cir. 1987) (quoting *In re Chilowsky*, 229 F.2d 457, 461, 108 USPQ 321, 325 (CCPA 1956)). This is especially true when the

specification provides so much disclosure on how to practice the claimed invention. For these reasons, it is clear that the Examiner's assertion is not supported by either the facts (as provided in the specification), or the law.

As to **the level of predictability in the art**, MPEP § 2164.03 teaches (emphasis added):

> The "predictability or lack thereof" in the art refers to the ability of one skilled in the art to extrapolate the disclosed or known results to the claimed invention. If one skilled in the art can readily anticipate the effect of a change within the subject matter to which the claimed invention pertains, then there is predictability in the art. On the other hand, if one skilled in the art cannot readily anticipate the effect of a change within the subject matter to which that claimed invention pertains, then there is lack of predictability in the art.

The Office Action argues, "since the state of the art does not recognize hydrogen species with a 'lower energy', predicting how any given hydrogen species or compound within the present claims is formed would be extremely difficult, even if these hydrogen species were shown to exist." Office Action, page 6, paragraph under header number 7. However, the Office Action has again merely misinterpreted this factor to mean that the prior art must disclose the claimed invention. Instead, this factor refers to "the ability of one skilled in the art to extrapolate the disclosed or known results to the claimed invention" (emphasis added). Applicant respectfully requests that the Examiner evaluate the level of predictability in the art according to the standard set forth in MPEP § 2164.03.

As to **the amount of direction provided by the inventor**, the Examiner apparently acknowledges only a small portion of the disclosure as providing "some general guidance," (referring to pages 29-32). Office Action at 4. In reality, the

Examiner's position is simply wrong and completely ignores the majority of the actual disclosure (pages 18-36). When the specification is actually consulted, it is clear that the Inventor provided a detailed disclosure of the parameters used to achieve the claimed invention, and such detail belies the Examiner's position that the specification is insufficient.

As to **the quantity of experimentation needed to make or use the invention based on the content of the disclosure**, MPEP § 2164.06 states, "'[A]n extended period of experimentation may not be undue if the skilled artisan is given sufficient direction or guidance.' *In re Colianni*, 561 F.2d 220, 224, 195 USPQ 150, 153 (CCPA 1977)."

The Office Action argues, "[p]lasma is a heated ionized gas in which electrons are removed from their corresponding atomic nuclei . . . In all of these plasma-dependent embodiments, the artisan would thus face the initial challenge of getting the electrons of hydrogen atoms to move closer to the nuclei in an environment which would tend to separate the electrons and nuclei." Office Action, page 4, paragraph under header number 1.

Applicant respectfully disagrees with the Examiner's position for at least the reason that the literature is replete with examples showing that this position is fundamentally flawed. For example, the reported Langmuir probe measurements for the electron density n_e for capacitively-coupled RF, glow discharge, inductively-coupled RF, and microwave plasma cells that are representative of the ionization fraction of

plasma cells of the present invention were 10^{10} - 10^{11} cm^{-3} **[a, b]**, 10^{9} - 10^{11} cm^{-3} **[c]**, 10^{9} cm^{-3} **[d]**, and $< 10^{9}$ cm^{-3} **[e]**, respectively.[2]

Contrary to the Examiner's assertion [that "[p]lasma is a heated ionized gas in which electrons are removed from their corresponding atomic nuclei], as shown, the corresponding ionization fraction is about 10^{-9} corresponding to essentially all of the atomic hydrogen in an ionized state.

In addition, the Examiner's basis for rejection, which is grounded in an unwavering reliance on quantum mechanics with its inherent definition of the ground state, is further rebutted by experimental evidence. For example, the Examiner's flawed theories are refuted by the isolation of hydrogen in more stable states in solid, liquid, and gaseous form and its definitive identification by many analytical techniques. The newly submitted evidence attached herewith describes working embodiments of a cell using atomic hydrogen and catalysts to form hydrogen with a binding energy greater

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a. S. B. Radovanov, K. Dzierzega, J. R. Roberts, J. K. Olthoff, Time-resolved Balmer-alpha emission from fast hydrogen atoms in low pressure, radio-frequency discharges in hydrogen", Appl. Phys. Lett., Vol. 66, No. 20, (1995), pp. 2637-2639.

b. S. B. Radovanov, J. K. Olthoff, R. J. Van Brunt, S. Djurovic, "Ion kinetic-energy distributions and Balmer-alpha (H_α) excitation in $Ar - H_2$ radio-frequency discharges", J. Appl. Phys., Vol. 78, No. 2, (1995), pp. 746-757.

c M. Kuraica, N. Konjevic, "Line shapes of atomic hydrogen in a plane-cathode abnormal glow discharge", Physical Review A, Volume 46, No. 7, October (1992), pp. 4429-4432.

d. D. Barton, J. W. Bradley, D. A. Steele, and R. D. Short, "Investigating radio frequency plasmas used for the modification of polymer surfaces," J. Phys. Chem. B, Vol. 103, (1999), pp. 4423-4430.

e. R. L. Mills, P. Ray, B. Dhandapani, J. He, "Comparison of Excessive Balmer α Line Broadening of Inductively and Capacitively Coupled RF, Microwave, and Glow Discharge Hydrogen Plasmas with Certain Catalysts", IEEE Transactions on Plasma Science, Vol. 31, No. (2003), pp. 338-355.

than 13.6 eV and heat even at the commercially useful level of 50,000 W (66 hp). See, attached Reports of Dr. Booker and Dr. Jansson.

For example, Dr. Booker concludes, in relevant part:

> Blacklight Power **has discovered a novel new heat source**. This reaction was observed in the fuel reaction cell experiment using a water flow calorimeter and in that experiment 10.8kJ of excess heat was generated. This was **6 times the amount of heat expected** from a simple reaction of the chemical elements involved
>
> ********
>
> The calorimeter appears to function properly, as seen from the calibration and the control experiments, where it was shown that **the calorimeter captured 99% of the heat** from the heater - a very efficient calorimeter.
>
> ********
>
> I am lead to the conclusion that the generation of the net excess heat in the fuel reaction cell experiment **is real and reproducible**.

Booker Report at last two pages. Similarly, Dr. Jansson reports:

> It is clear from the data collected by Rowan University at the BLP Laboratories that **significant excess heat well in excess** of the accuracy of the calorimetry system **has been generated** in the experimental run reported above.
>
> ********
>
> To be more precise the calculated results indicate that the heat generated during the Experimental run which used proprietary BLP chemical **produced over 640% energy than is available** in known exothermic chemical reactions for compounds within the cell.

Jansson Report at page 12. See also Table 3 at page 13.

These reports, couples with the very extensive body of evidence submitted in response to prior Office Actions, not yet properly considered by the Examiner, clearly

rebut the Examiner's assertion of enablement, specifically for the quantity of experimentation needed to make and use the claimed invention.

For these reasons, Applicant disagrees with the Examiner's characterization of there being an "initial challenge" of generating the lower-energy hydrogen. Further, it is clear that the Examiner improperly evaluates the quantity of experimentation needed to make or use the invention based on the prior art. Instead, *In re Wands* expressly states that the Examiner must evaluate the quantity of experimentation needed "based on the content of the disclosure" (emphasis added). Applicant therefore respectfully requests that the Examiner evaluate the quantity of experimentation needed based on the content of the disclosure, as required by MPEP § 2164.06.

Since the Office Action has failed to establish a *prima facie* case of lack of enablement for at least the reasons explained above, Applicant respectfully requests that the Examiner withdraw this rejection.

III. CONCLUSION

In view of the foregoing remarks, Applicant respectfully requests reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

/Louis Troilo/

Dated: July 21, 2008

By:_____
Louis M. Troilo
Reg. No. 45,284